

TFT LCD Approval Specification

MODEL NO.: V315B5 -- L02

Customer: _____
Approved by: _____
Note:

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REVISION HISTORY

Version	Date	Page (New)	Section	Description
Ver 2.0	Apr 14,2009	All	All	Approval Specification was first issued.

1. GENERAL DESCRIPTION

1.1 OVERVIEW

V315B5-- L02 is a 31.5" TFT Liquid Crystal Display module with 4U--type CCFL Backlight unit and 1ch--LVDS interface. This module supports 1366 x 768 WXGA format and can display 16.7M (6--bit+Hi--FRC) colors. The inverter module for backlight is built--in.

1.2 FEATURES

- High brightness (450 nits)
- Ultra--high contrast ratio (3000:1)
- Fast response time (gray to gray average 8.5ms)
- High color saturation NTSC 72%
- Ultra wide viewing angle : 176(H)/176(V) (CR \geq 20) with Super MVA technology
- DE (Data Enable) only mode
- LVDS (Low Voltage Differential Signaling) interface
- Color reproduction (nature color)
- Low color shift function

1.3 APPLICATION

- TFT LCD TVs
- Multi--Media Display

1.4 GENERAL SPECIFICATIONS

Item	Specification	Unit	Note
Active Area	697.6845 (H) x 392.256 (V) (31.51" diagonal)	mm	(1)
Bezel Opening Area	703.8 (H) x 398.4 (V)	mm	
Driver Element	a--si TFT active matrix	--	
Pixel Number	1366 x R.G.B. x 768	pixel	
Pixel Pitch (Sub Pixel)	0.17025(H) x 0.51075 (V)	mm	
Pixel Arrangement	RGB vertical stripe	--	
Display Colors	16.7M	color	
Display Operation Mode	Transmissive mode / Normally black	--	
Surface Treatment	Anti--Glare coating (Haze 11%),Hard coating (3H)	--	

1.5 MECHANICAL SPECIFICATIONS

Item	Min.	Typ.	Max.	Unit	Note	
Module Size	Horizontal(H)	759	760	761	mm	(1)
	Vertical(V)	449	450	451	mm	(1)
	Depth(D)	31.5	32.5	33.5	mm	To Rear
	Depth(D)	49.2	50.2	51.2	mm	To inverter cover
Weight	---	5330	---	g		

Note (1) Please refer to the attached drawings for more information of front and back outline dimensions.

2. ABSOLUTE MAXIMUM RATINGS

2.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T _{ST}	-20	+60	°C	(1)
Operating Ambient Temperature	T _{OP}	0	+50	°C	(1), (2)
Shock (Non--Operating)	S _{NOP}	--	50	G	(3), (5)
Vibration (Non--Operating)	V _{NOP}	--	1.0	G	(4), (5)

Note (1) Temperature and relative humidity range is shown in the figure below.

(a) 90 %RH Max. ($T_a \leq 40$ °C).

(b) Wet--bulb temperature should be 39 °C Max. ($T_a > 40$ °C).

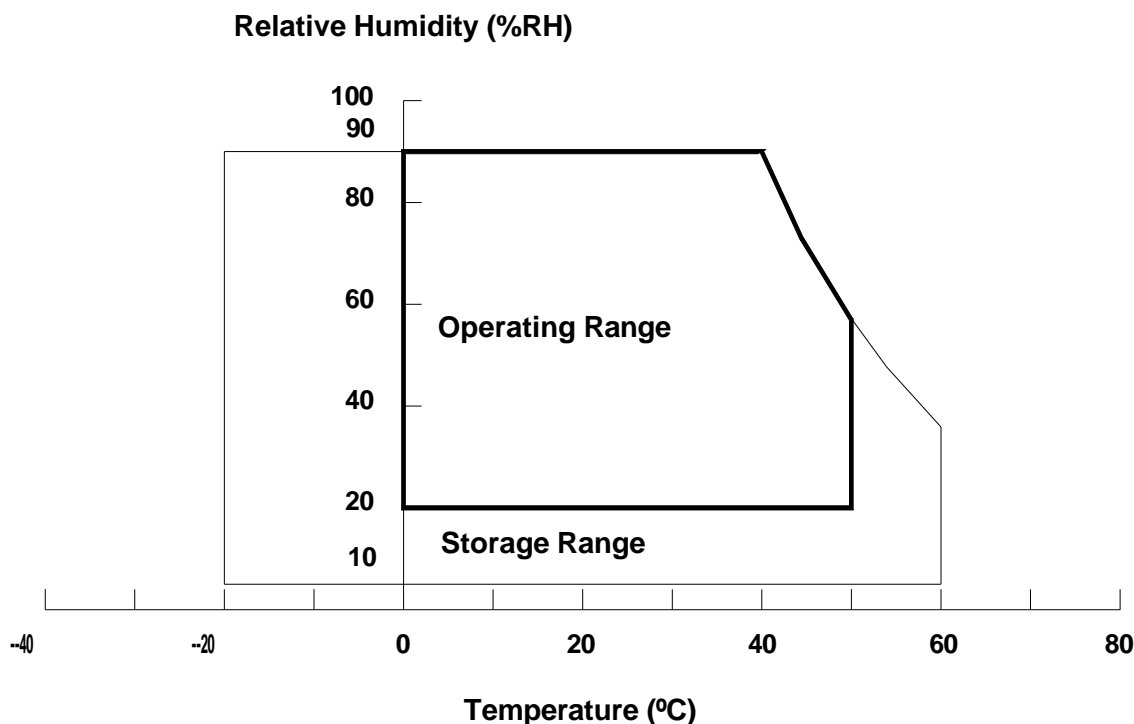
(c) No condensation.

Note (2) The maximum operating temperature is based on the test condition that the surface temperature of display area is less than or equal to 65 °C with LCD module alone in a temperature controlled chamber. Thermal management should be considered in final product design to prevent the surface temperature of display area from being over 65 °C. The range of operating temperature may degrade in case of improper thermal management in final product design.

Note (3) 11 ms, half sine wave, 1 time for $\pm X$, $\pm Y$, $\pm Z$.

Note (4) 10 ~ 200 Hz, 10 min, 1 time each X, Y, Z.

Note (5) At testing Vibration and Shock, the fixture in holding the module has to be hard and rigid enough so that the module would not be twisted or bent by the fixture.



2.2 Package storage

When storing modules as spares for a long time, the following precaution is necessary.

- (a) Do not leave the module in high temperature, and high humidity for a long time. It is highly recommended to store the module with temperature from 0 to 35°C at normal humidity without condensation.
- (b) The module shall be stored in dark place. Do not store the TFT--LCD module in direct sunlight or fluorescent light.

2.3 ELECTRICAL ABSOLUTE RATINGS

2.3.1 TFT LCD MODULE

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	V _{CC}	-0.3	13.0	V	(1)
Input Signal Voltage	V _{IN}	-0.3	3.6	V	

2.3.2 BACKLIGHT UNIT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Lamp Voltage	V _W	—	3000	V _{RMS}	
Power Supply Voltage	V _{BL}	0	30	V	(1)
Control Signal Level	—	-0.3	7	V	(1), (3)

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Functional operation should be restricted to the conditions described under normal operating conditions.

Note (2) No moisture condensation or freezing.

Note (3) The control signals include On/Off Control, Internal PWM Control, External PWM Control.

3. ELECTRICAL CHARACTERISTICS

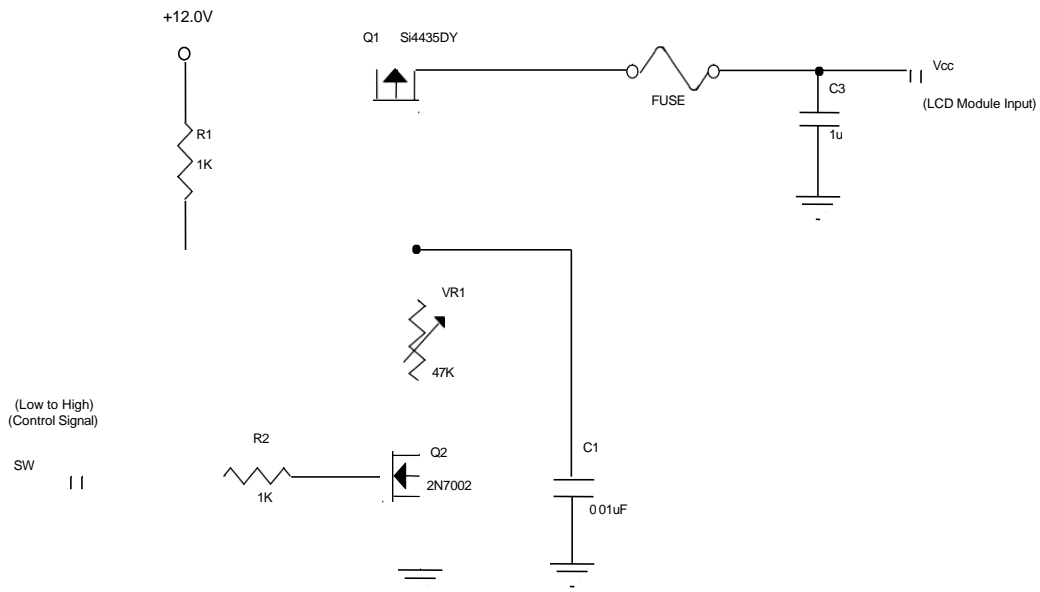
3.1 TFT LCD MODULE

Ta = 25 ± 2 °C

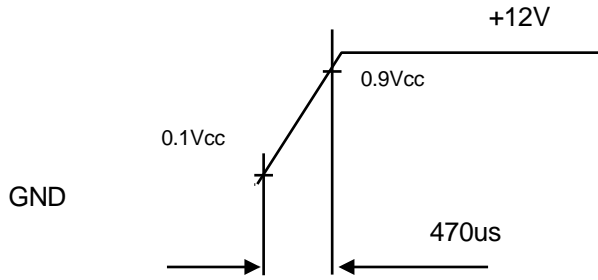
Parameter		Symbol	Value			Unit	Note
			Min.	Typ.	Max.		
Power Supply Voltage		V _{CC}	11.4	12.0	12.6	V	(1)
Power Supply Ripple Voltage		V _{RP}	--	--	100	mV	
Rush Current		I _{RUSH}	--	--	3.5	A	(2)
Power Supply Current	White	I _{CC}	--	0.43	0.52	A	(3)
	Black		--	0.32	--	A	
	Vertical Stripe		--	0.43	--	A	
LVDS Interface	Differential Input High Threshold Voltage	V _{LVTH}	+100	--		mV	
	Differential Input Low Threshold Voltage	V _{LVTL}		--	-100	mV	
	Common Input Voltage	V _{LVC}	1.125	1.25	1.375	V	
	Terminating Resistor	R _T	--	100	--	ohm	
CMOS interface	Input High Threshold Voltage	V _{IH}	2.7	--	3.3	V	
	Input Low Threshold Voltage	V _{IL}	0	--	0.7	V	

Note (1) The module should be always operated within above ranges.

Note (2) Measurement Conditions:

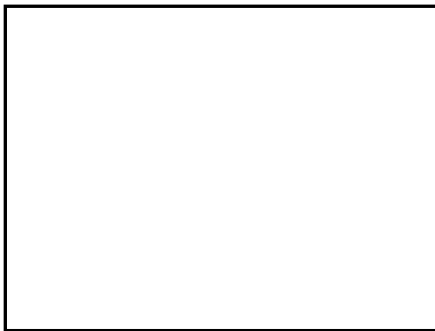


Vcc rising time is 470us



Note (3) The specified power supply current is under the conditions at $V_{cc} = 12V$, $T_a = 25 \pm 2 \text{ }^\circ\text{C}$, $f_v = 60 \text{ Hz}$, whereas a power dissipation check pattern below is displayed.

a. White Pattern



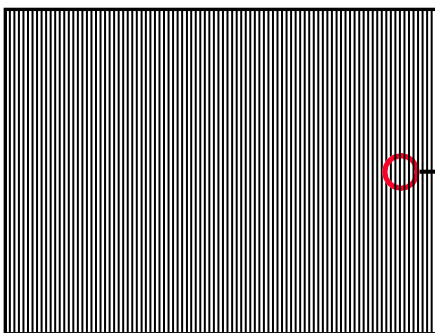
Active Area

b. Black Pattern

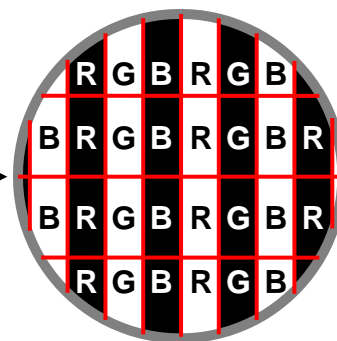


Active Area

c. Vertical Stripe Pattern



Active Area



3.2 BACKLIGHT INVERTER UNIT

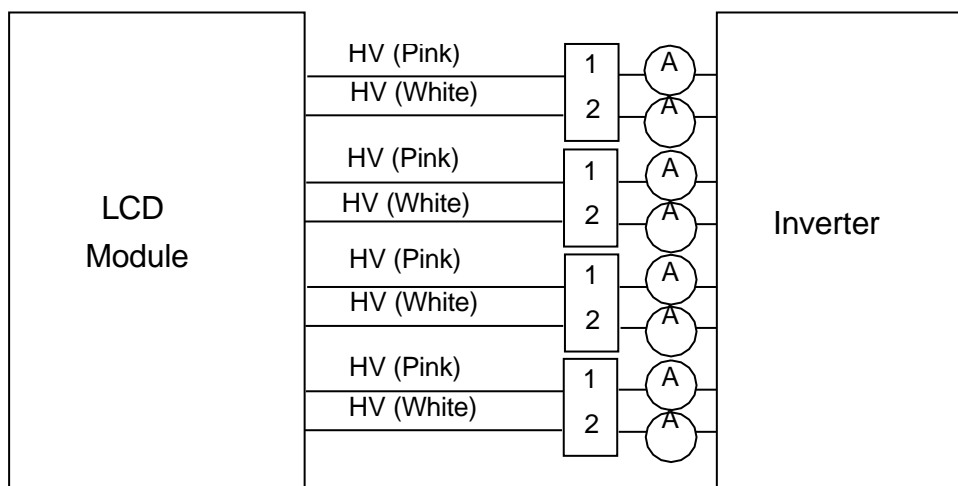
3.2.1 CCFL (Cold Cathode Fluorescent Lamp) CHARACTERISTICS (Ta = 25 ± 2 °C)

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Lamp Voltage	V _W	--	1550	--	V _{RMS}	I _L = 10.5mA
Lamp Current	I _L	10	10.5	11	mA _{RMS}	(1)Hot side
Lamp Starting Voltage	V _S	--	--	2700	V _{RMS}	(2), Ta = 0 °C
		--	--	2290	V _{RMS}	(2), Ta = 25 °C
Operating Frequency	F _O	30	--	80	KHz	(3)
Lamp Life Time	L _{BL}	50,000	--	--	Hrs	(4)

3.2.2 INVERTER CHARACTERISTICS (Ta = 25 ± 2 °C)

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power Consumption	P _{BL}	--	65	69	W	(5),(6), I _L = 10.5mA
Input Voltage	V _{BL}	22.8	24	25.2	V _{DC}	
Input Current	I _{BL}	--	2.71	2.88	A	Non Dimming
Input Ripple Noise	--	--	--	912	mV _{P-P}	V _{BL} =22.8V
Oscillating Frequency	F _W	60	63	66	kHz	(3)
Dimming frequency	F _B	150	160	170	Hz	
Minimum Duty Ratio	D _{MIN}	--	20	--	%	

Note (1) Lamp current is measured by utilizing **AC current probe Tektronix P6022** as shown below:



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